

COMMISSIONERS  
MIKE GLEASON - Chairman  
WILLIAM A. MUNDELL  
JEFF HATCH-MILLER  
KRISTIN K. MAYES  
GARY PIERCE

ORIGINAL



ARIZONA CORPORATION COMMISSION



0000083083

Director, Safety Division Arizona Corporation Commission

DOCKETED

MAR 26 2008

2008 MAR 26 P 4:39

AZ Staff Memorandum  
DOCKET CONTROL

DOCKETED BY

ne

To: THE COMMISSION

DOCKET NO. RR-03639A-08-0066

From: Safety Division

Date: March 27, 2008

RE: IN THE MATTER OF THE APPLICATION OF THE MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION TO UPGRADE A CROSSING OF THE UNION PACIFIC RAILROAD AT QUEEN CREEK ROAD IN MARICOPA COUNTY, ARIZONA, AAR/DOT NO. 741-678-S.

### Background

On February 4, 2008, the Maricopa County Department of Transportation ("MCDOT") filed with the Arizona Corporation Commission ("Commission") an application for approval for the Union Pacific Railroad ("Railroad") to upgrade an existing crossing at Queen Creek Road in Maricopa County, Arizona at AAR/DOT No. 741-678-S. Commission Safety Division Staff ("Staff") issued data requests and those data requests and the Railroads responses (without attachments), are included as attachments to this memorandum.

MCDOT's filing in this application requests approval for the Railroad to upgrade an existing crossing of the Union Pacific Railroad at Queen Creek Road, on the Railroad's Chandler Industrial Lead. MCDOT is the controlling road authority for Queen Creek Road. Flashing lights and automatic gates were first put into service at this location by Commission Decision No. 55060 in 1986.

On March 1, 2006, Staff, the Railroad, MCDOT, and consultants, participated in a diagnostic review of the proposed improvements to Queen Creek Road. The following is a break down of the crossing in this application, including information about the crossing that was provided to Staff by MCDOT and the Railroad.

### Geographical Information

This crossing is located where the Chandler Industrial rail line (runs north-south) crosses Queen Creek Road (runs east-west). This crossing is east of Arizona Avenue (.26 miles), and west of McQueen Road (.74 miles). The approximate distance between Arizona Avenue and McQueen Road is .9 miles.

**COMMISSIONERS**  
MIKE GLEASON - Chairman  
WILLIAM A. MUNDELL  
JEFF HATCH-MILLER  
KRISTIN K. MAYES  
GARY PIERCE



**ARIZONA CORPORATION COMMISSION**

**BRIAN C. MCNEIL**  
Executive Director  
  
**DAVID RABER**  
Director, Safety Division

The Chandler Municipal Airport is approximately 1.31 miles northeast of the railroad crossing. To the north of the crossing .51 miles is Appleby Road, and to the south of the crossing is Ryan Road, approximately the same distance away, .51 miles, both of these crossings are at grade. Most of the land on the north and south side of the crossing is used for agricultural purposes. To the east and west there are several housing developments. For a map of the area, see Appendix A of this staff report.

**Queen Creek Road**

The County is proposing to widen the roadway from a two lane road, to a six lane road with a 16- foot wide raised median. There will be three lanes of traffic in each direction east and west. The railroad will install new 12' LED flashing lights and automatic gates in the median, as well as a new concrete crossing surface. There will also be cantilevers installed for both directions of traffic. Constant warning time circuitry will also be installed as part of this crossing improvement project.

Traffic data for Queen Creek Road was taken from the February 1999, Maricopa County Department of Transportation, Queen Creek Road Design Concept Report, Section 3.0 Roadway Characteristics. It states that the current ADT for Queen Creek Road is 6,748 vpd. Projected ADT's for the year 2020 are 29,700 vpd. The Level of Service (LOS) was taken from the same report, and shows the LOS to be LOS B for the existing two-lane roadway. The report shows a projected LOS for the year 2020 to be LOS A for the AM peak hours, and LOS C for the PM peak hours for a four lane roadway.

**Note:** The American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, 2004, states that the Level of Service characterizes the operating conditions on a facility in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. This is a measure of roadway congestion ranging from LOS A--least congested--to LOS F--most congested. LOS is one of the most common terms used to describe how "good" or how "bad" traffic is projected to be.

The posted speed limit on Queen Creek Road is 45 MPH. Commission Rail Safety Section, as well as Federal Railroad Administration ("FRA") accident/incident records indicate one accident on Queen Creek Road on 6/8/1988, with one injury, and no fatalities at this crossing.

**COMMISSIONERS**  
MIKE GLEASON - Chairman  
WILLIAM A. MUNDELL  
JEFF HATCH-MILLER  
KRISTIN K. MAYES  
GARY PIERCE



## ARIZONA CORPORATION COMMISSION

BRIAN C. MCNEIL  
Executive Director  
  
DAVID RABER  
Director, Safety Division

The estimated cost of the proposed railroad crossing upgrade is \$702,220. MCDOT and the City of Chandler are sharing the cost of the crossing improvements.

### Train Data

Data provided by the railroad regarding train movements through this crossing are as follows:

**Train Count:** Average of 2 trains per day

**Train Speed:** 20 mph

**Thru Freight/Switching Moves:** All train movements through this crossing are thru movements with no switching operations, according to Union Pacific's Public Projects Manager Jim Smith.

### Schools and Bus Routes

Information about schools, and school buses, in the area was provided by Sterling Skoulson, the Transportation Director for the Chandler Unified School District #80. Queen Creek Road is a major route for buses; he estimated that there would be hundreds of crossings a day, not only by buses from his district but also adjacent ones. He did state, however, that they have very little delay from having to stop for a train and the delay normally does not last over 10 minutes.

Valley Metro currently does not use Queen Creek on any of its routes. The nearest public bus facility is a Park & Ride near Chandler Boulevard and Chicago Street, approximately three miles away. Bus bays will be constructed with this project for future use.

There are three schools near the Queen Creek Road crossing, they are as follows;

Elementary: Hancock Elementary: 2425 S. Pleasant Road,  
Basha Elementary: 3535 S. Basha Road  
Junior High: Bogle Jr. High: 1600 W. Queen Creek Road,  
Santan Jr. High: 1550 E. Chandler Hts. Road  
High School: Hamilton High School 3700 S. Arizona Avenue

### Hazardous Materials

Staff asked the County if they knew of any hazardous material traffic across these crossings, and this was their answer:

*We are unable to provide this information. The City does not require a permit for hazardous material.*

COMMISSIONERS  
MIKE GLEASON - Chairman  
WILLIAM A. MUNDELL  
JEFF HATCH-MILLER  
KRISTIN K. MAYES  
GARY PIERCE



## ARIZONA CORPORATION COMMISSION

BRIAN C. MCNEIL  
Executive Director  
  
DAVID RABER  
Director, Safety Division

### Hospitals

The nearest hospital to this crossing is the Chandler Regional Hospital, located at 415 South Dobson Road. Other health care facilities located in the area are:

Arizona Orthopedic Surgical Hospital	2905 W. Warner Road
UGR Health Center	2815 N. Alma School Road
Hope Community Medical Center	312 N. Alma School Road
Mercy Gilbert Medical Center	475 S. Dobson Road

Information provided by the County about emergency services indicated that there are no set routes for emergency trips. Emergency service vehicles use the streets that get them to their destination by the shortest distance.

### Zoning

Information about zoning in the area came from the City of Chandler's Final Chandler Airpark Area Plan. It shows a mixture of industrial, light industrial, neighborhood commercial, and a public/semi-public area for the City's Waste Transfer Station and Water Treatment Plant. Except for the existing plant, the area is currently farm land.

### Grade Separation

With regard to grade separating Queen Creek Road, the MCDOT gave the following response:

*No studies were performed to determine if an overpass was required. The proximity of the RR to Arizona Avenue, the loss of access to the properties along Queen Creek Road, the few numbers of trains, the low speed of the trains, and no RR related accidents were sufficient reasons to retain the at-grade crossing.*

*The total estimated construction, design, construction administration, utility relocation and right-of-way cost is estimated to be \$19,000,000, if a grade separation was to be built.*



**COMMISSIONERS**  
**MIKE GLEASON - Chairman**  
**WILLIAM A. MUNDELL**  
**JEFF HATCH-MILLER**  
**KRISTIN K. MAYES**  
**GARY PIERCE**



**ARIZONA CORPORATION COMMISSION**

**BRIAN C. MCNEIL**  
**Executive Director**  
  
**DAVID RABER**  
**Director, Safety Division**

**FHWA GUIDELINES**

The Federal Highway Administration (FHWA) Railroad-Highway Grade Crossing Handbook (Revised Second Edition August 2007) provides nine criteria for determining whether highway-rail crossings should be considered for grade separation or otherwise eliminated across the railroad right of way. The Crossing Handbook indicates that grade separation or crossing elimination should be considered whenever one or more of the nine conditions are met. The nine criteria are applied to this crossing application as follows:

<b>FHWA - GRADE SEPARATION GUIDELINES</b>		
<p>Highway-rail grade crossings should be considered for grade separation or <b>otherwise eliminated across the railroad right of way whenever one or more of the following conditions exist:</b></p>		
		<b>Crossing 1</b>
The highway is a part of the designated Interstate Highway System	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2020	NO
The highway is otherwise designed to have full controlled access	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2020	No
The posted highway speed equals or exceeds 70 mph	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2020	NO
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2020	NO
Maximum authorized train speed exceeds 110 mph	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2020	NO
An average of 150 or more trains per day or 300 million gross tons/year	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2020	No
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural; or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing Currently meets the criteria	No
	Crossing meets the criteria by 2020	No

**COMMISSIONERS**  
MIKE GLEASON - Chairman  
WILLIAM A. MUNDELL  
JEFF HATCH-MILLER  
KRISTIN K. MAYES  
GARY PIERCE





**ARIZONA CORPORATION COMMISSION**

**BRIAN C. MCNEIL**  
Executive Director  
  
**DAVID RABER**  
Director, Safety Division

Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing Currently meets the criteria	No
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria	No

Having reviewed all applicable data, Staff supports the Counties application. Staff believes that the upgrades are in the public interest and are reasonable. Therefore, Staff recommends approval of the Counties application.

  
Dave Raber  
Director  
Safety Division

  
Brian H. Lehman  
Railroad Supervisor  
Safety Division

CW 1.1 Provide Average Daily Traffic Counts for each of the three locations.

This is taken from the *February 1999, Maricopa County Department of Transportation, Queen Creek Road Design Concept Report, Section 3.0 Roadway Characteristics*.

Existing = 6,748 vehicles per day (vpd), 24-hr. unadjusted volume  
Year 2020 = 29,700 project daily traffic volume

CW 1.2 Please describe the current Level of Service (LOS) at each intersection.

This is taken from the *February 1999, Maricopa County Department of Transportation, Queen Creek Road Design Concept Report, Section 3.0 Roadway Characteristics*.

Existing = LOS B for a two-lane undivided roadway  
Year 2020 = eastbound LOS A/C (AM/PM peak hour), westbound LOS C/A (AM/PM peak hour) for a four-lane facility divided by a raised or painted median.

CW 1.3 Provide any traffic studies done by the road authorities for each area.

The original traffic analysis for this project was incorporated into the "Design Concept Report for Queen Creek Road, Arizona Avenue to McQueen Road" prepared for the County in February 1999 by BRW. The Traffic Analysis section of that report is attached.

CW1.4 Provide distances in miles to the next public crossing on either side of the proposed project location. Are any of these grade separations?

Arizona Avenue is 0.26 miles to the west of the RR crossing, McQueen Road is 0.74 miles to the east, and the future Hamilton Street is 0.24 miles to the east. All of these intersections of the streets with McQueen Road are at-grade intersections.

CW1.5 How and why was grade separation not decided on at this time? Please provide any studies that were done to support these answers.

No studies were performed to determine if an overpass was required. The proximity of the RR to Arizona Avenue, the loss of access to the properties along Queen Creek Road, the few numbers of trains, the low speed of the trains, and no RR related accidents were sufficient reasons to retain the at-grade crossing.

CW1.6 If this crossing was grade separated, provide a cost estimate of the project.

The total estimated construction, design, construction administration, utility relocation and right-of-way cost is estimated to be \$19,000,000.

CW1.7 Please describe what the surrounding areas are zoned for near this intersection. i.e. Are there going to be new housing developments, industrial parks etc.

✓  
From the City of Chandler's Final Chandler Airpark Area Plan shows a mixture of industrial, light industrial, neighborhood commercial, and a public/semi-public area for the City's Waste Transfer Station and Water Treatment Plant. Except for the existing plant, the area is currently farm land but development plans have been submitted.

CW1.8 Please supply the following: number of daily train movements through the crossing, speed of the trains, and the type of movements being made (i.e. thru freight or switching). Is this a passenger train route?

20 MPH.  
From a January 17, 2008 e-mail from Jim Smith/UPRR: The track is the "Chandler Industrial Lead" and there are an average of two trains per day. The maximum Time Table Speed is 10 mph. The Union Pacific does not have any active plans to construct a second mailing track at this crossing. This is not a passenger train route.

CW1.9 Please provide the names and locations of all schools (elementary, junior high and high school) within the area of the crossing.

✓  
Queen Creek Road between Arizona Avenue and McQueen Road is in the Chandler Unified School District #80 and is within the boundaries of the following schools:

Elementary:	Hancock Elementary	2425 S. Pleasant Road
	Basha	3535 S. Basha Road
Junior High:	Bogle Jr. High	1600 W. Queen Creek Road
	Santan Jr. High	1550 E. Chandler Hts. Road
High School:	Hamilton High School	3700 S. Arizona Avenue

CW1.10 Please provide school bus route information concerning the crossing, including the number of times a day a school bus crosses this crossing.

✓  
Per a phone conversation with Sterling Skoulson, the Transportation Director for Chandler Unified School District #80, Queen Creek Road is a major route for the buses and he estimated that there would be hundreds of crossings a day, not only by buses from his district but also the adjacent ones. He did state, however, that they have very little delay from having to stop for a train and the delay normally does not last over 10 minutes.



CW1.11 ✓ Please provide information about any hospitals in the area and whether the crossing is used extensively by emergency service vehicles.

The main hospital in the area is the Chandler Regional Hospital at 415 South Dobson Road. Other health facilities include:

Arizona Orthopedic Surgical Hospital	2905 W. Warner Road
UGR Health Center	2815 N. Alma School Road
Hope Community Medical Center	312 N. Alma School Road
Mercy Gilbert Medical Center	475 S. Dobson Road

Our contact with emergency services indicated that there are no set routes for emergency trips. The vehicles use the streets that get them to their destination by the shortest distance.

CW1.12 ✓ Please provide total cost of improvements to each crossing.

This project's street improvement cost at the RR crossing is estimated at \$40,000. The UPRR's estimated improvement cost to the crossing is \$702,220.

CW 1.13 ✓ Provide any information as to whether vehicles carrying hazardous materials utilize this crossing and the number of times a day they might cross it.

We are unable to provide this information. The City does not require a permit for hazardous material.

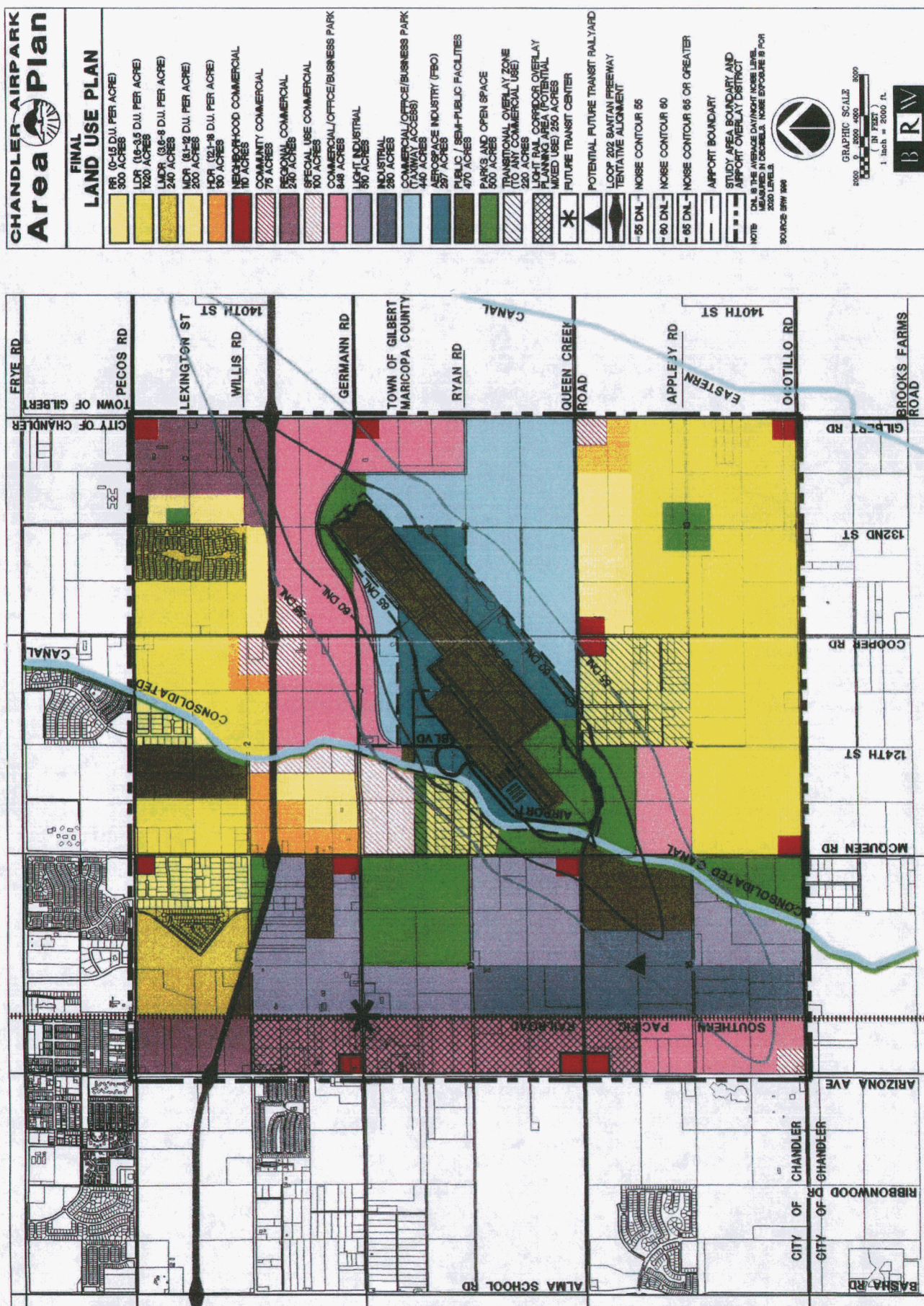
CW 1.14 ✓ Please provide the posted vehicular speed limit for the roadway.

45 MPH

CW 1.15 ✓ Do any buses (other than school buses) utilize the crossing, and how many times a day do they cross the crossing.

Valley Metro currently does not use Queen Creek on any of its routes. The nearest bus facility is a Park & Ride near Chandler Boulevard and Chicago Street, approximately three miles away. Bus bays will be constructed with this project for future use.







**QUEEN CREEK ROAD  
ARIZONA AVENUE TO MCQUEEN ROAD**

**ESTIMATED COST OF RR OVERPASS  
CWS, DRR, MG: February 2008**

Assume a 200' long by 115' wide bridge with full height retaining walls

Bridge:	(200 ft) x (115 ft) x (\$125/sq.ft.)=	\$2,875,000
Walls:	(4000 ft) x (15 ft Avg) x (\$35/sq.ft.) =	\$2,100,000
Rdwy Fill:	(108,063 CY under prism) x (\$10/CY)=	\$1,080,630
Subtotal:		\$6,055,630
Misc. Add ons for Rdwy, Mob, Dust, Survey, E&C @ 50%) =		\$3,027,815
Subtotal Construction:		\$9,083,445
Design @ 8% =		\$726,676

R/W:	The choices would be a total take of 2 parcels or put in frontage road. Assume a take of 2 parcels	\$8,100,000
------	--	-------------

69 kV Relocation:	4 poles @ \$250,000 each	\$1,000,000
-------------------	--------------------------	-------------

TOTAL COST OF OVERPASS:		\$18,910,121
	Use	\$19,000,000

**Cost for the RR Crossing**

Swlk:	(640 sq.ft.) x (\$3/sq.ft.)	\$1,920
Dwy:	(1,090 sq.ft.) x (\$4.50/sq.ft.)	\$4,905
Pavement:		\$24,000
Median Curb:	(190 ft) x ( \$12/ft)	\$2,280
C&G	(160 ft) x ( \$15/ft)	\$2,400
Median Paving:	(144 sq. ft.) x ( \$4.50/sq.ft.)	\$648
AC Ramps:		\$200
Subtotal		\$36,353
	Use	\$40,000

UPRR Improvement Cost from the Agreement with MCDOT:	\$702,220
--	-----------



4561 E. McDowell Road  
Phoenix, AZ 85008  
602.454.0402  
602.454.0403 (fax)

Memo

**To:** Arizona Corporation Commission Office of  
Railroad Safety  
Attn: Chris Watson  
2200 N. Central, Suite 300  
Phoenix, AZ 85004

**Date:** January 25, 2008

**Subject:** Arizona Corporation Commission  
Application for UPRR and Queen Creek  
**Project:** Queen Creek Road, Arizona Avenue to  
McQueen Road

**Project** MCDOT On-Call Contract, 2005-72, A  
**Number:** MCDOT Project No. 68966 (TT087)  
AZTEC Project No. AZE0718

**From:** Curt Slagell, P.E. *CWS*

This memo is submitted to the Arizona Corporation Commission (ACC) as an application to request an upgrade to an existing Union Pacific Railroad (UPRR) crossing, on behalf of Maricopa County Department of Transportation (MCDOT).

**i Location of Crossing**

The Queen Creek Road, Arizona Avenue to McQueen Road project includes the improvements of Queen Creek Road to a six lane roadway with a 16-foot wide raised median across the UPRR right-of-way. The UPRR and Queen Creek crossing is approximately 1,370 feet east of Arizona Avenue and 1,260 feet west of Hamilton Street. Representatives from the ACC, UPRR, MCDOT, and consultants attended a field meeting on March 1, 2006.

**ii Why the Crossing is Needed**

The railroad crossing at Queen Creek Road is existing. This project is a roadway widening of the existing crossing.

**iii Why the Existing Crossing Cannot be Grade Separated**

With the proposed improvements to Queen Creek Road, the location of the at-grade crossing remains unchanged. A grade separation would have the following undesired consequences: 1) Access to existing farm roads and to anticipated development would be severed for approximately 2,000 feet (1,000 feet each side of the tracks) along Queen Creek Road; 2) There are several utilities in Queen Creek Road that cannot support 30 feet of additional embankment needed for a grade-separated crossing; 3) There is insufficient right-of-way to accommodate a 30-foot high embankment slopes along Queen Creek Road; and 4) There is inadequate distance between the railroad and the existing Arizona Avenue/Queen Creek Road intersection to raise the roadway grade over the railroad without violating sight-distance requirements.

**iv Type of Warning Devices to be Installed**

The warning devices for eastbound and westbound traffic included in the design are as follows: gates with flashing lights will be installed in the median and outside the roadway near the sidewalk; cantilever flashing railroad signals will be installed outside the roadway near the sidewalk; and railroad crossing warning signs will be placed per MUTCD, Part 8 standards.

**v Who will Maintain the Crossing Warning Devices**

UPRR will own and maintain the physical elements of the crossing (crossing surface, gates, flashing lights). The City of Chandler will own and maintain the approaching surface, signing and movement markings on Queen Creek Road.

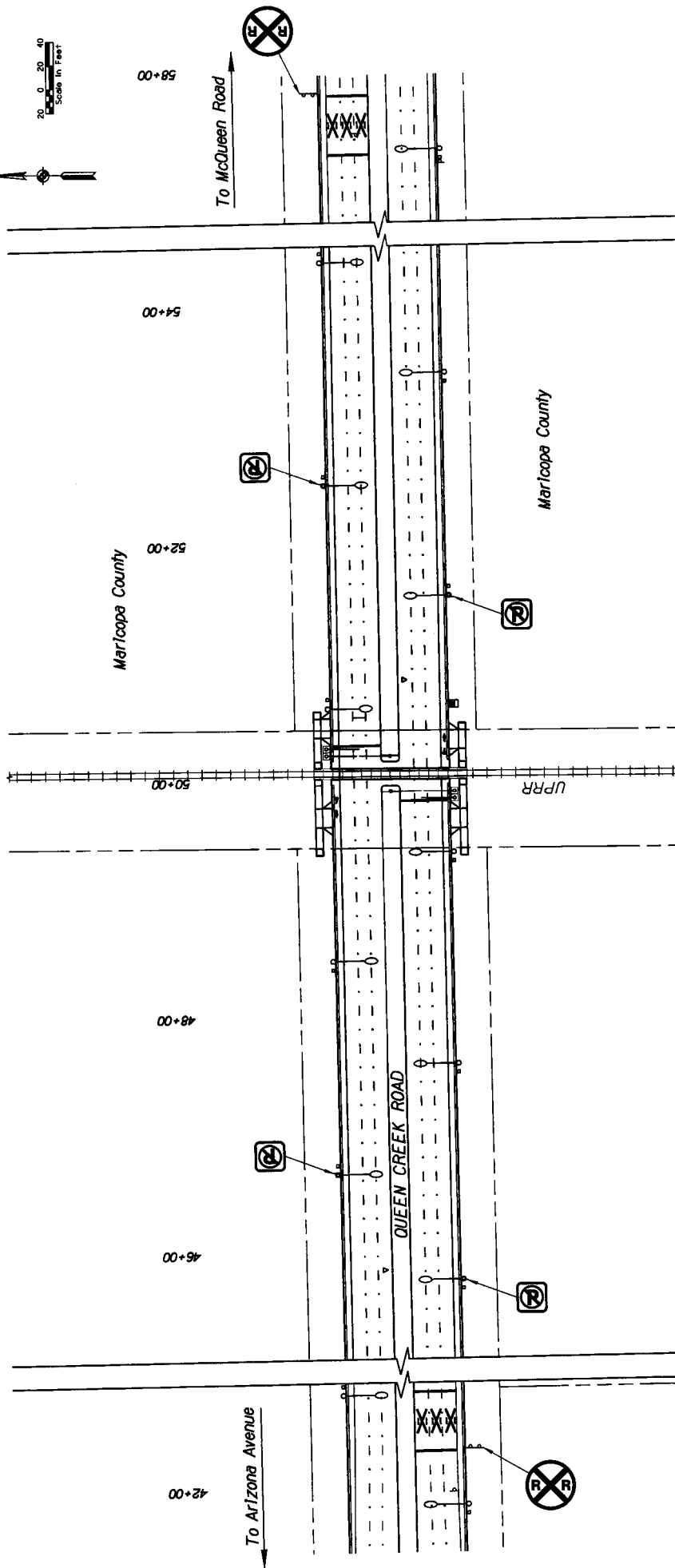
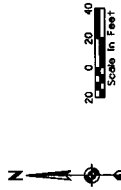
**vi Who is Funding the Project**

MCDOT and City of Chandler are funding this project.

c: Kelly Roy/MCDOT



FEDERAL REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
9	AZ	TT087	1	1	



LEGEND

- RAILROAD SIGNAL CROSSING GATE
- PROPOSED STREET LIGHT
- RAILROAD SIGNAL
- CANTILEVER STRUCTURE

MARICOPA COUNTY  
DEPARTMENT OF TRANSPORTATION  
ENGINEERING DIVISION



QUEEN CREEK ROAD  
ARIZONA AVENUE TO MCQUEEN ROAD  
PROJECT NO. TT087  
SHEET 1 of 1

# **Appendix : A**



